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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,293	03/20/2008	Masaki Ohara	IWI-16783	6590

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EXAMINER	
SAVAGE, JASON L	
ART UNIT	PAPER NUMBER
1784	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,293	OHARA ET AL.	
	Examiner	Art Unit	
	JASON L. SAVAGE	1784	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,8-19,28,32-38,40 and 42-54* is/are pending in the application.

4a) Of the above claim(s) *46-53* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,8-19,28,32-38,40 and 42-45,54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *20100806, 20100630*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 54 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The Examiner was unable to find a basis for the recited claim limitation that the metallic glass has a crystallization degree of 10% or lower.

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-4, 8-14, 17-19, 28, 40 and 42-45 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Branagan et al. (XP-002553675 Article: Wear-Resistant Amorphous and Nanocomposite Steel Coatings).

Branagan teaches a metallic glass laminate formed by thermal spray deposition (p. 2616, col. 1, first paragraph). Branagan further teaches that the density of the

coating layer is > 99.9 % meaning the porosity of the coating layer is less than 0.01% (p. 2617, col. 1, Thermal Spray Coatings and Properties).

Branagan does not explicitly recite that the supercooled liquid temperature range Tx is equal to or greater than 30°C, however since it teaches that the alloys selected for the metallic glass alloy have low critical cooling rates for class formation, it is the position of the Examiner that the supercooled liquid temperature range would be within the claimed range. In the alternative, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized an amorphous phase forming material having a high supercooled liquid temperature range Tx to insure the thus formed coating exhibited good properties in amorphous formability.

Regarding claims 2-3, the claims are drawn to an article, not the method of making. However, Branagan is considered to meet the recited method limitations wherein deposition occurs in a supercooled liquid state and via a thermal spraying method (p. 2616, col. 1, 1st par.).

Regarding claims 4 and 28, Branagan teaches the thickness of the coating may be as much as 330 and 1650 m (p. 2618 – Figures 7 and 8).

Regarding claims 8-9, Branagan teaches the spray method may comprise HVOF (p. 2616, col. 1, Experimental Procedure) which would form sprayed particles which are thinly collapsed as claimed.

Regarding claims 10-11, Branagan teaches the metallic glass contains at least one element such as Fe in a range of 63% (p. 2616, col. 1, Experimental Procedure).

Regarding claim 13, Branagan teaches the substrate may be selected from aluminum alloys (p. 2617, Thermal Spray Coating and Properties) which would meet the claim limitation regarding a light metal with the recited specific gravity.

Regarding claim 14, the sprayed coating of Branagan would inherently have some pattern even if the pattern was random. In the alternative, it would have been obvious to one of ordinary skill in the art to have recognized that a desirable structure or pattern could be formed in the coating with a reasonable expectation of success.

Regarding claims 17 and 19, although Branagan is silent to the metallic glass laminates ability to absorb hydrogen, as disclosed by Applicant in the specification in par [0013], metallic glasses that can be laminated on base materials without forming a pinhole may be used as hydrogen separation membranes. Since the metallic glass of Branagan does not form pinholes, it would be considered to be just as capable of absorbing hydrogen as the article claimed by Applicant.

Regarding claim 18, Branagan teaches that metallic glass bulks can be formed due to delamination of the substrate (p. 2618 col. 1). In the alternative, it would have been obvious to one of ordinary skill in the art to recognize that the metallic glass layer could be separated from the substrate and utilized separately with a reasonable expectation of success.

Regarding claims 40 and 42-45, although Branagan is silent to the formed metallic glass laminate being a solder-corrosion resistant member, the article of Branagan would have been just as solder-corrosion resistant as the article claimed by Applicant since it is formed of the same materials, structure and properties such as

claimed. Regarding the limitation that a contact surface to molten solder may be a lead-free solder, any surface of the laminate of Branagan could be contacted with a molten solder which may be any solder material including a lead-free solder. In the alternative, it is known in the art that metallic laminates having coatings of corrosion resistant amorphous alloys laminated thereon are suitable for a variety of uses including soldering iron tips. It would have been obvious to one of ordinary skill in the art to have utilized the amorphous alloy laminate of Branagan for a soldering iron tip since the laminate exhibits good properties of corrosion resistance and adhesion to the base layer.

Claim Rejections - 35 USC § 103

Claims 15-16, 32-38 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Branagan et al. (XP-002553675 Article: Wear-Resistant Amorphous and Nanocomposite Steel Coatings).

Regarding claims 15 and 16, Branagan is silent to the coating have a convexo-concave pattern or having a mirror-like smooth surface, however it would have been obvious to one of ordinary skill in the art to have formed the coatings having desirable structural shapes and/or polished surfaces with a reasonable expectation of success. One of ordinary skill would have been motivated to provide such structures to the coating layers so as to obtain coatings exhibiting desirable properties such as suitable anodic polarizations.

Regarding claims 32-34, Branagan is silent as to the substrate being porous, however it is known in the art to form metallic glass amorphous coatings on a variety of substrate materials including porous substrates. It would have been obvious to one of ordinary skill in the art to have formed the coating of Branagan on a porous substrate with a reasonable expectation of success. The thus formed laminate would exhibit a selective hydrogen gas permeability such as claimed.

Regarding claims 35-36, Branagan teaches a thickness of 330 m and although it is silent to the pore diameter, since it forms the thermal sprayed coating layer utilizing powders having an average size of 25 m (p. 2616, col. 2, A. Powder Production and Properties), one of ordinary skill would expect the pore diameter to fall within the claimed range.

Regarding claim 37, Branagan is silent to the substrate being tubular however it teaches that the HVOF deposition can be utilized to apply a coating to a wide variety of substrates (p. 2621. col. 1, CONCLUSIONS). It would have been obvious to on e of ordinary skill to have applied the coating to any suitable shape including tubular substrates with a reasonable expectation of success.

Regarding claim 38, the metallic glass laminate of Branagan would be considered to meet the limitation of a gas separation membrane as claimed.

Regarding claim 54, although the prior art does not exemplify an embodiment wherein the crystallization degree is 10% or lower although it teaches an embodiment wherein the crystallization is 14% which is achieved from powder having an original crystallization of 54%. It would have been obvious to one of ordinary skill in the art to

have formed a sprayed coating having an lower crystallization degree by selecting starting material with a higher metallic glass content with a reasonable expectation of success.

Response to Arguments

Applicant's arguments filed 6-14-10 have been fully considered but they are not persuasive.

Applicant argues that since Branagan discloses in Figure 9 that coatings deposited by plasma spraying and HVOF have different DTA percentages compared to the original starting powder, the coatings formed by the HVOF and plasma spraying method of Branagan are no longer metallic glass. However, Branagan explicitly discloses that the thus formed coatings contain 41% glass in the HVOF coating and 86% in the plasma sprayed coating (p.2619, col. 1) and thus seem to be at least partially metallic glass. While the thermal behavior may be different between the starting powder and the formed coating, the claims are drawn to an article, not the method of making. Furthermore, the claims are not commensurate in scope with the DTA percentage of the starting powder in comparison to the thus formed coatings.

Regarding the limitation that the ΔTx is 30°C or higher, Applicant discloses that metallic glasses exhibit wide supercooled liquid temperature ranges. Since the coatings of Branagan are metallic glass containing as much as 86% glass, one would expect they would also exhibit a wide supercooled liquid temp range such as within the range claimed.

It is also noted in Applicant's arguments that it is asserted that Fig 9 of Branagan, the powder seems to have a Tg and Tx, but for both HVOF and plasma sprayed coating(s) do NOT have a Tg and ΔTx (page 12 of the present response). However, it is noted that the present invention desirably utilizes HVOF as a preferred coating method yet for some reason do have a Tg and ΔTx unlike the prior art as asserted by Applicant. This argument is not persuasive since both teach HVOF as a suitable formation method and thus would both be expected to exhibit the same Tg and ΔTx properties.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON L. SAVAGE whose telephone number is (571)272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Savage/
Examiner
8-27-10

/Jennifer C. McNeil/
Supervisory Patent Examiner, Art Unit 1784